FAA-E-2083a
July 27, 1970
SUPERSEDING
FAA-E-2083, 3/16/64
& AMEND.-1, 12/21/67

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION SPECIFICATION

BYPASS SWITCH, ENGINE GENERATOR

1. SCOPE

1.1 Scope.- The equipment covered by this specification is a bypass (isolation) switch which will isolate, by manual operation, an emergency engine generator set from both the commercial power and the facility load at an air navigation facility for the purpose of adjustment, maintenance or repair of the engine generator without interruption of the facility.

1.2 Classification.- The bypass switches furnished under this specification shall be as follows:

Class I	3 phase, 9 pole
Class II	1 phase, 6 pole

2. APPLICABLE DOCUMENTS

2.1 FAA drawing.-

B-21216 Standard Nameplate

2.2 Military and Federal publications.- The following Military and Federal publications, of the issues in effect on the date of the contract schedule, form a part of this specification and are applicable to the extent specified herein.

2.2.1 Military specifications.-

MIL-C-104	Crates, Wood; Lumber and Plywood Sheathed, Nailed and Bolted
MIL-P-116	Preservation, Methods of
MIL-T-152	Treatment, Moisture and Fungus - Resistant, Of Communications, Electronic, and Associated Electrical Equipment.
MIL-V-173	Varnish, Moisture and Fungus - Resistant (For Treatment of Communications, Electronic, and Associated Electrical Equipment)

2.2.2 Military standard.-

MIL-STD-129	Marking for Shipment and Storage

2.2.3 Federal specifications.-

TT-E-489	Enamel, Alkyd Gloss
TT-P-636	Primer Coating, Alkyd, Wood and Ferrous metal

2.2.4 Federal standards.-

FED-STD-102	Preservation, Packaging, and Packing Levels
FED-STD-595	Colors

2.3 Other publications.-

Underwriters' Laboratories, Inc., UL-508, Industrial Control Equipment.

National Electrical Manufacturers Association, XC-l, Industrial Control.

(Copies of the above documents may be obtained as follows:

This specification and applicable FAA drawing from Federal Aviation Administration, Washington, D. C. 20590, Attention: Contracting Office

Federal specifications and standards from General Services Administrati Offices in Atlanta; Auburn, Washington; Boston; Chicago; Denver; Fort Worth; Kansas City, No.; Los Angeles; New Orleans; New York; San Francis co; and Washington, D. C.

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Federal specifications and standards from General Services Administrati Offices in Atlanta; Auburn, Washington; Boston; Chicago; Denver; Fort Worth; Kansas City, No.; Los Angeles; New Orleans; New York; San Francis co; and Washington, D. C.

3.4 Finish.- The bypass switch enclosure shall be properly primed in accordance with Federal Specification TT-P-636 - Primer Coating, Synthetic Wood and Ferrous Metal and painted inside and out with alkyd gloss enamel Federal Specification TT-E-489, Class A, Gray, Color Code No. 16376 of Federal Standard for Colors, No. 595.

3.5 Solenoid lock.- The solenoid lock shall be of the positive engagement type with an operating coil suitable for continuous energization at the voltage specified in the invitation for bids. The coil operating voltage shall not exceed 600 volts. For voltages in excess of 600 volts a step-down transformer shall be used. The solenoid coil leads shall terminate at a terminal block for external connection. The terminals shall be marked "X---X,"

The solenoid lock shall be designed to lock the manual operating control (3.8) when the solenoid coil is energized from generated voltage. This is to prevent the bypass switch from being operated and impressing generated voltage on the normal (commercial) power supply,

3.6 Indicating light.- The indicating light, with red lens, shall be visible from outside the bypass switch enclosure and shall be connected and energized to light when the switch is in the "bypass" position using power from the normal source terminals of the bypass switch. The lamp voltage for the indicating light shall be limited to 125 volts. For voltages in excess of 125 volts a step-down transformer shall be used.

3.7 Contacts .- Overlapping pressure contacts shall be provided which are suitable for continuous duty at full rated load when enclosed in an unventilated sheet metal enclosure. Enclosures for bypass switches rated in excess of 800 amperes may be ventilated. Contacts shall be silver to silver or silver alloy brazed to associated parts. All members of moving and fixed contact assemblies shall be conveniently adjustable and replaceable, by *one* person, from the front of the switch panel enclosure. Contact temperature rise shall not exceed UL-508 allowable temperature rises when carrying full load current in the metal enclosure. Multiple contacts, electrically paralleled per phase to increase current carrying capacity, will not be permitted. The current paths shall be conducted through flexible conductors, busses or through double break contact assemblies.

3.7.1 Contact sequencing.- The engine generator bypass switch is require to provide manual bypass and isolation of the generator set and transfer switch without interruption to the facility load. Contacts which are closed in *the* "NORMAL" position shall overlap with the contacts which are closed in the "BYPASS" position and this overlap shall be sustained only during operation of the switch from "NORMAL" to "BYPASS" positions.

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3.7.1 Contact sequencing.- The engine generator bypass switch is require to provide manual bypass and isolation of the generator set end transfer switch without interruption to the facility load. Contacts which are closed in *the* "NORMAL" position shall overlap with the contacts which are closed in the "BYPASS" position and this overlap shall be sustained only during operation of the switch from "NORMAL" to "BYPASS" positions.

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4.2 Inspection.- Where inspection is not waived, each engine generator bypass switch shall be inspected at the contractor's plant by a representative of the Government for workmanship, finish, and general conformance with the specification requirements. One bypass switch of each size shall be given a complete type test; all other switches shall be given the production test. The contractor shall furnish all tools, meters, equipment and labor to make the following tests:

4.3 Type test.- The type test shall include a check for the following:

Allowable temperature rise on contacts at full current, paragraph 3.7. This test shall not be required more often. than once in every five years on bypass switches having been previously approved and having contacts of identical design and contact pressure.

Verification of contact sequencing, paragraph 3.7.1.

Operation of manual time delay, paragraph 3.7.1.

Operation of the solenoid lock, paragraph 3.5.

A dielectric test shall be made on each bypass switch of each rating on the contract schedule, The test voltage shall be 1000 volts plus twice the rated voltage of the bypass switch applied continuously for a period of 60 seconds.

Each bypass switch shall be given a megger test, In no case shall the resistance reading be less than one megohm.

4.3.1 Failures in test.- Failure to meet the official type test will require substantial corrective action on the part of the contractor before resubmission for another official test. Substantial corrective action shall be interpreted to mean that the component which caused the failure is either modified to prevent a recurrence of the failure or replaced with a new component of different make or design. If the failure was due to an obviously defective part, replacement of the part with the same m&e or design is permitted.

During production testing, should failures occur in the same component or part at the rate of one or more in three, it shall be replaced with a component of a different and more substantial design. Similarly, should the switch fail to meet a performance requirement in production testing at a rate exceeding one in three, the component or components responsible for the failures shall be replaced in a like manner. This failure rate criteria is applicable to contracts of six or more units.

Any component change or alteration made to the production units which may effect the ability of the switch(s) to meet the type test will necessitate requalifying the switch(s) under the type testing requirements.

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6.2 Ordering data.- Procurement documents should specify:

(a) Title, number, and dates of this specification and amendments thereto.

(b) The class of the bypass switch(s) required (1.2) (3.10).

(c) Number of bypass switcher required.

(d) Specify current rating, operating voltage and phase of the bypass switch(s) (3.9).

(e) Operating voltage of the solenoid lock(s) (3.5).

(f) Fungus proofing (5.1).

(g) Domestic or overseas shipment (5.).

(h) Serial numbers after award of contract (3.3.2).

(i) Contractor's nameplates in lieu of FAA standard nameplates (3.3.2).

(j) Packing and packaging levels (5.2.4).

(k) Spare parts (3.14).